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**Report for the Stage 3 in-depth review of emission
inventories submitted under the UNECE LRTAP
Convention and EU National Emissions Ceilings
Directive for:**

Slovenia

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INTRODUCTION

1. The mandate and the overall objectives for the emission inventory review process under the LRTAP Convention are given by the UNECE document '*Methods and Procedures for the Technical Review of Air Pollutant Emission Inventories reported under the Convention and its Protocols*'⁽¹⁾ – hereafter referred to as the 'Methods and Procedures' document.
2. This annual review has concentrated on SO₂, NO_x, NMVOC, NH₃, plus PM₁₀ & PM_{2.5} for the time series years 1990 – 2009, reflecting current priorities from the EMEP Steering Body and the Task Force on Emission Inventories and Projections (TFEIP). HMs and POPs have been reviewed to the extent possible.
3. This report covers the stage 3 centralised reviews of the UNECE LRTAP Convention and EU NEC Directive inventories of Slovenia coordinated by the EMEP emission centre CEIP acting as review secretariat. The review took place from 27th June to 1st July 2011 in Copenhagen, Denmark, and was hosted by the European Environment Agency (EEA). The following team of nominated experts from the roster of experts performed the review: Generalist – Anne Wagner (UK), Energy – Sophie Hoehn (CH) and Giorgos Mellios (GR), Industry – Kees Peek (NL), Solvents – Ioannis Sempos (GR), Agriculture + Nature – Romain Joya (FR), Waste – Intars Cakaras (LIT).
4. Kevin Hausmann (DE) was the lead reviewer. The review was coordinated by Katarina Marečková (EMEP Centre on Emission Inventories and Projections - CEIP).

¹ Methods and Procedures for the Technical Review of Air Pollutant Emission Inventories reported under the Convention and its Protocols. Note by the Task Force on Emission Inventories and Projections. ECE/EB.AIR/GE.1/2007/16 <http://www.unece.org/env/documents/2007/eb/ge1/ece.eb.air.ge.1.2007.16.e.pdf>

PART A: KEY REVIEW FINDINGS

5. Slovenia submits an inventory of good quality in 2011 covering the complete time series for historical and projected emissions for the majority of pollutants. Slovenia participates actively in the stage 3 review process providing further information and data where requested, with a fast turnaround of questions. The support provided by the Party enabled the ERT to have a solid understanding on the inventory processes and thus to perform an in-depth review. Overall, the Slovenian CLRTAP inventory is in line with the EMEP/EEA guidebook, clearly incorporating the main processes and procedures.

INVENTORY SUBMISSION

6. The inventory is in line with the EMEP/EEA Inventory Guidebook and the UNECE Reporting Guidelines. Emissions are reported under CLRTAP and NECD. In the 2011 submission, Slovenia provides a national inventory for the full time series in NFR09 categories from 1980 to 2009. The ERT commends Slovenia for providing projected emissions in NFR09 categories and associated socio-economic data up to 2030 for the NECD pollutants.

7. The IIR presents the information by NFR source in a clear and detailed structure, providing the methodologies used for the majority of sources. The ERT also notes that recalculations have been applied consistently throughout the entire time series. A Tier 1 approach has been applied to most key categories (IIR p19). Further improvements identified during this review are presented in part B of this report.

KEY CATEGORIES

8. Slovenia has compiled a Key Category Analysis (KCA) consistent with the EMEP/EEA Guidebook for emissions of all reported pollutants occurring in 2009. The definition threshold used is in line with the Guidelines (80%). In fact, Slovenia lists all emission sources by NFR code in its IIR for all main pollutants. The ERT encourages Slovenia to present the key sources also by trend assessment as well as percentage contributions to total emissions, and to use Tier 2 or 3 methods for all key sources in line with the EMEP/EEA Guidebook. To clarify this issue, the ERT recommends that Slovenia adds in the IIR chapter "2.5 Key Categories (to be updated each year)" the trend for all key sources over the reporting period and the percentage contribution to the national total.

QUALITY

Transparency

9. Slovenia clearly lists the data sources used by NFR code (Table 1). It also includes a concise and detailed presentation of key trends by pollutant over the time series. The ERT commends Slovenia for providing clear information on the methodology used in form of equations for most pollutants and NFR sectors. To improve transparency, the ERT suggests providing data sources and references for all emission factors and activity data by pollutant and source (Tier 1/2/3) in the individual sector chapters.

10. Most of the information is provided at detailed level; however, in each sector more information on missing sources (either the source or the pollutant does not exist) and activity data time series could be included in the IIR to improve transparency further. The ERT encourages Slovenia to provide replies to the Stage 1 and 2 reviews.

11. Slovenia provides two sets of projections in the 2008 and 2009 NFR tables. The data in both tables are inconsistent with the data presented in the IIR. To improve transparency the ERT suggests reporting only the projections corresponding to the most recent NECD submission as well as indicating the base year in the "With Measures" and "With Additional Measures" templates.

Completeness

12. Slovenia has reported emissions for most pollutants in NFR09 and the complete time series. The ERT encourages Slovenia to report emissions from As, Cr, Cu, Ni, Se and Zn for the complete time series. PM10, PM2.5 and TSP emissions have been reported from 2000 onwards. The ERT encourages Slovenia to report emissions from 1980 onwards. After the review, Slovenia indicated that it would expand the coverage of its time series for these pollutants with its next submission.

13. The ERT commends Slovenia for providing projected emissions and socio-economic data up to 2030 for the "With Measures" and "With Additional Measures" scenarios. The ERT encourages Slovenia to provide the information in the 'Additional Info' in the reporting template, providing NFR codes for sectors with Notation Keys, especially 'IE'.

14. The ERT notes that the IIR does not list all sources that are not estimated by pollutant. The ERT encourages Slovenia to add more information as to why these sources are currently not reported (e.g. lack of activity data, source does not exist in Slovenia) and whether there are plans to report them in the future.

15. Slovenia does not currently perform an uncertainty analysis. Slovenia commented that an uncertainty analysis had been performed on the activity data as part of UNFCCC reporting. Changes made to the UNFCCC data also fed into the CLRTAP and NECD submission. The ERT encourages Slovenia to provide quantitative uncertainties of the emission estimates, especially for key sources, in their next submission.

Consistency, including recalculations and time series

16. Explanations for emission trends are provided for all main pollutants. The ERT encourages Slovenia to provide more detail on dips and jumps in the time series (e.g. large step changes in the emission trend for SO_x throughout the time series).

17. The IIR includes information on recalculations in each sector. The ERT encourages Slovenia to provide the source, years and the pollutant for which recalculations have been performed and whether they have been applied across the time series.

Comparability

18. The ERT notes that the inventory of Slovenia is comparable with those of other reporting parties. The allocation of source categories follows that of the

EMEP/EEA reporting Guidelines. The ERT encourages Slovenia to provide further information on the methodologies used for compiling emissions of projections.

CLRTAP/NECD comparability

19. The emissions reported to NECD and CLRTAP are not consistent for NMVOC and NH₃ for the years 2008 and 2009. Emissions reported to the NECD prior to 2008 differed from emissions reported under CLRTAP for all NECD pollutants.

Accuracy and uncertainties

20. Slovenia performed an uncertainty analysis as part of the 2011 submission following UNFCCC guidance and review comments. The ERT encourages Slovenia to provide quantitative uncertainty estimates of the emission estimates, especially for key sources in their next submission. Slovenia commented that all activity data is now undergoing automated checks as part of the new inventory system (ISSE) combining UNFCCC and UNECE reporting.

21. The ERT encourages Slovenia to provide further documentation of the trend analysis to verify that identified dips and jumps are not due to over- or underestimations of emissions in certain years.

Verification and quality assurance/quality control approaches

22. The quality control and quality assurance (QA/QC) procedures carried out by Slovenia are very well documented. The IIR covers in good detail the institutional arrangements, the inventory preparation process and the QA/QC. Slovenia has implemented an automated QA/QC plan in accordance with the EMEP/EEA Guidebook embedded in their new inventory system (ISSE). This includes general QA/QC procedures (Tier 1) applied to the whole inventory at all times and elements of sector specific procedures (Tier 2). The Party also defined roles and responsibilities for inventory compilation, improvement and QA/QC.

FOLLOW-UP TO PREVIOUS REVIEWS

23. The current stage 3 centralised review has used outputs from the stage 1 and stage 2 review processes. The ERT encourages Slovenia to refer to these previous reviews when examining this review report, and when updating its improvement plans.

AREAS FOR IMPROVEMENT IDENTIFIED BY SLOVENIA

24. Slovenia does not list any improvement in the IIR. During the stage 3 review Slovenia confirmed that improvements made for the UNFCCC inventory feed through into improvements to the CLRTAP inventory. An internal review of the inventory has not taken place.

25. During the centralised review and exchanges with the ERT, some improvements have been identified by Slovenia:

- (a) The reporting of, and references for, the applied emission factors will be further developed in future inventories. This will include further QA/QC checks on plant-specific emission factors.
- (b) Uncertainty estimates are based mainly on default uncertainty levels for activity rates and emission factors. Default uncertainty levels will be updated according to the updated EMEP/EEA Guidebook (EEA 2009).
- (c) Considering the need to provide more details on the notation keys used, especially 'IE'.
- (d) Provide more detail on the description of time series trends, and drivers for trends, recalculations and improvements should be reported in future IIR submissions.

26. The ERT recognises the level of effort undertaken by Slovenia in providing a detailed inventory. Any questions issued by the ERT to the Party were addressed promptly and descriptive responses were provided enabling good communication during the review process.

PART B: RECOMMENDATIONS FOR IMPROVEMENTS TO THE PARTY

CROSS-CUTTING IMPROVEMENTS IDENTIFIED BY THE ERT

27. The ERT has identified the following cross-cutting issues for improvement:
28. ERT recommends reporting emissions of PM₁₀, PM_{2.5} and TSP, As, Cr, Cu, Ni, Se and Zn for the complete time series.
29. The ERT recommends that Slovenia provides qualitative uncertainty estimates.
30. The ERT recommends that Slovenia provides information in the 'Additional Info' section of the reporting template, providing NFR codes for sectors with 'IE'.
31. The ERT recommends that Slovenia reports only key sources that contribute an accumulated 80% of the total emissions and that it applies at least Tier 2 methodologies.
32. The ERT recommends that data sources and references should be added for all emission factors and activity data by pollutant and source (Tier 1/2/3) in the individual sector chapters.
33. The ERT encourages Slovenia to provide further information on the methodologies used for compiling emissions of projections.
34. The ERT recommends that Slovenia adds the trends for all key sources over the reporting period as well as percentage contributions to the national total.

SECTOR SPECIFIC RECOMMENDATIONS FOR IMPROVEMENTS IDENTIFIED BY ERT

ENERGY

Review Scope

Pollutants Reviewed		NOx, NMVOC, SOx, NH3, PM10 & PM2.5, TSP, CO, Pb, Cd, Hg, PCDD/PCDF, PAH, HCB, PCB		
Years		1990 – 2009		
NFR Code	CRF_NFR Name	Reviewed	Not Reviewed	Recommendation Provided
1.A.1.a	public electricity and heat production	x		x
1.A.1.b	petroleum refining	x		x
1.A.1.c	Manufacture of solid fuels and other energy industries	x		x
1.A.2.a	iron and steel	x		x
1.A.2.b	non-ferrous metals	x		x
1.A.2.c	chemicals	x		x
1.A.2.d	pulp, paper and print	x		x
1.A.2.e	food processing, beverages and tobacco	x		x
1.A.2.f.i	Stationary Combustion in Manufacturing Industries and Construction: Other (Please specify in your IIR)	x		x
1.A.2.f.ii	Mobile Combustion in Manufacturing Industries and Construction: (Please specify in your IIR)			
1 A 3 e	Pipeline compressors?			
1.A.4.a.i	commercial / institutional: stationary	x		x
1.A.4.a.ii	commercial / institutional: mobile ?			
1.A.4.b.i	residential plants	x		x
1.A.4.b.ii	household and gardening (mobile)			
1.A.4.c.i	Agriculture/forestry/fishing. stationary	x		x
1.A.4.c.ii	off-road vehicles and other machinery?			
1.A.4.c.iii	national fishing?			
1.A.5.a	other, stationary (including military)	x		x
1.A.5.b	other, mobile (including military, land based and recreational boats)?			
1.B.1.a	coal mining and handling	x		x
1.B.1.b	solid fuel transformation	x		x
1.B.1.c	other fugitive emissions from solid fuels	x		x
1 B 2 a i	Exploration, production, transport	x		x
1 B 2 a iv	Refining / storage	x		x
1 B 2 a v	Distribution of oil products	x		x
1 B 2 b	Natural gas	x		x
1 B 2 c	Venting and flaring	x		x
1 B 3	Other fugitive emissions from geothermal energy production , peat and other energy extraction not included in 1 B 2			

Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which codes have been reviewed and which have not in the respective columns.

General recommendations on cross-cutting issues.

Transparency:

35. Data sources for stationary energy are well described in the IIR of Slovenia, and references for emission factors and Net Calorific Values (NCVs) are also presented in the IIR. To improve transparency, the ERT encourages Slovenia to add activity data of sub-sectors in the IIR. Slovenia also provides good methodology explanations in the IIR. The ERT would welcome some explanation connecting the data with the methodology (i.e. which equation has been used to calculate which emissions). See sector specific issues 1 and 2 below.

Completeness:

36. Emissions for 1 A are generally complete and NE has been applied only for some heavy metals. The IIR provides good information about the sources of fuel used, the emission factors and the NCVs. However, in order to improve completeness, the ERT recommends that Slovenia adds activity tables with information about all reported sources.

37. Emissions for 1 A 5 are missing in the NFR tables and in the IIR. The ERT recommends that Slovenia reports these emissions. See issue 10.

38. Emissions for 1 B are reported in the NFR tables and mentioned in the key source categories. But explanations about sources, activity data, emission factors and emissions are missing in the IIR. The ERT recommends that Slovenia improves the IIR for sub-sector 1 B. See issue 11 below.

39. Explanations for NE and IE are not mentioned in the IIR and not reported in the "Additional Info" sheet of the NFR tables. Therefore, the ERT encourages the Party to improve the IIR and to complete the Additional Info table.

40. The ERT has noticed that the Party has not reported PM_{2.5}, PM₁₀ and TSP before 2000. The ERT recommends reporting TSP for the whole time series, in accordance with the Guidelines. Moreover, because of the need for environmental assessment, there is a great benefit when the coverage of reported data is as complete as possible for all pollutants. The ERT thus encourages Slovenia to also provide time series for PM_{2.5} and PM₁₀.

Consistency including recalculation and time series:

41. Slovenia answered the ERT questions very precisely and by providing a lot of useful information about jumps and the evolution of emissions over the time series. The ERT encourages Slovenia to continue adding this precious information to the IIR, not only in the trends part but also in the chapter descriptions. This will clearly improve the consistency of the data and of the IIR. The ERT encourages Slovenia to check for outliers in the time series in general and for the issues 7 and 9 in particular.

42. The ERT welcomes the information about recalculations provided in the energy sector of the IIR. In order to improve the completeness and the transparency of the recalculations, the ERT encourages the Party to augment the description of recalculations with more details and explanations; by describing the rationale and the

impact on the sector, including the implications for trends in the energy sector in the IIR.

Comparability:

43. The ERT noticed some differences between NECD and CLRTAP tables, in particular for NMVOC in 1 A 1 a. Both submissions should present the same amount of emissions; therefore the ERT encourages the Party to verify the consistency of the reports.

Accuracy and uncertainties:

44. QA/QC procedures have been implemented by the Party for the energy sector and the first purpose of this procedure is to verify the consistency between ETS Data and statistical data (from the office for statistics). The accuracy of the IIR of Slovenia for the energy chapter could be improved with some additional quality checks for the IIR tables. The ERT encourages the Party to implement sector specific procedures for the consistency of the tables provided in the IIR. See issues 1, 3 and 5.

Improvement:

45. No improvements are planned for the energy sector by the Party. The ERT noticed some inconsistency between the IIR tables and some missing values too. The ERT also noticed that some emission factor sources are from the Guidebook 1992. Therefore the ERT encourages the Party to improve the consistency of the IIR tables and to include the missing values. Moreover, the Party should consider using the EMEP/EEA Guidebook 2009 for reviewing some emission factors. Please refer to the sector specific recommendations below for details.

Sub-sector Specific Recommendations.

46. Slovenia's IIR describes the methodologies used to calculate the emissions by providing equations. These are in accordance with the EMEP/CORINAIR Guidebook. The ERT encourages the Party to improve the description of the methodology by adding definitions of the terms used in the equations and to signal which equation has been used to calculate the emissions.

47. The Party uses country-specific emission factors based on measurement. The ERT recommends that the Party adds information about measurements and the acquisition of country-specific emission factors. Moreover, Tier 1 emission factors may deviate from the Guidebook 2009 because they come from the Guidebook 1992. The ERT recommends that the Party considers an up-date of the emission factors following the newest Guidebook. See issue 4.

Category issue 1: 1.A - Emission Factors

48. The ERT noticed some inconsistency and some missing values or incorrect references in the IIR tables (22, 23, and 27). Slovenia has already provided a corrected table. The ERT recommends that Slovenia corrects this in the next IIR. Moreover, the ERT encourages the Party to add the names of the Guidebook tables where the emission factors are taken from. Finally, if some activity data (i.e. LPG) are 0, the corresponding emission factors can be removed from the IIR tables.

Category issue 2: 1.A.1 - Energy Industries - Methodology

49. The ERT identified a unit problem in Equation 2. Slovenia has already provided the correction. The ERT recommends that the Party corrects the equation in the whole chapter of the IIR for the next submission. To improve transparency, the ERT also encourages the Party to develop the methodology by adding definitions of the terms used (i.e. RMM) in the Equations 3 and 4 and to signal which equation has been used to calculate the emissions.

Category issue 3: 1.A.1.a - Emission Factors - Hg

50. Hg EFs have been corrected according to expert judgement for lignite since 1995 and for brown coal since 2004. In order to improve the transparency of the IIR, the ERT recommends that the Party mentions which years have been changed due to recalculation in the text but also in the table legend (Tables 28, 29, 30). The ERT also recommends adding all this important information about sub-bituminous coal to the IIR.

Category issue 4: 1.A.1.b - Emission Factors - NO_x

51. Slovenia mentioned the Default Emission factor Handbook 1992 as source for NO_x EFs for 1 A 1 b. The ERT noticed that these EFs are higher than the actual EFs from the Guidebook 2009. For gas oil and natural gas the value is outside the 95% confidence interval. Therefore, the ERT recommends that the Party checks if the mentioned EFs should be up-dated.

Category issue 5: 1.A.1.b - NCV

52. Following questions of the ERT, Slovenia has provided some corrections for Table 43. The ERT also encourages the Party to give more explanations about stopping the use of lignite from Velenje. Finally, the ERT also recommends giving an explanation about the substitution of domestic sub-bituminous coal by imported coal and why anthracite is not used any more.

Category issue 6: 1.A.1.b - AD

53. The ERT encourages Slovenia to add information about the fact that the estimate of "Inappropriate Consumption of Fuel" (Table 51) dates back to 2006 and to specify whether it is still relevant. In general, the ERT recommends adding activity data for all sources in the IIR.

Category issue 7: 1.A.4.a-b - NH₃

54. The ERT welcomes the suggestion for improvement of Slovenia for NH₃ emissions and encourages the Party to add such improvements to the next submission (NFR tables and IIR).

Category issue 8: 1.A.4.c - Stationary plants

55. In the IIR the Party explains that not enough data are available for stationary sources, so that they are included in the commercial and institutional sector. The ERT encourages Slovenia to improve chapter 1 A 4 c, in particular 1 A 4 c i.

Category issue 9: 1.A.4.c - AD, EF, Emissions

56. The ERT encourages Slovenia to improve 1 A 4 c by separating emissions from agriculture from those arising from forestry. The Party already uses the EFs from the Guidebook but only the ones for Agriculture. The EFs for forestry are slightly different, so if the Party does have AD, it would be a good improvement to use also the EFs for forestry (included in the same table in the Guidebook).

Category issue 10: 1.A.5 - AD, EF, Emissions

57. The ERT recommends that Slovenia reports emissions from sector 1 A 5.

Category issue 11: 1.B - AD, EF

58. Responding to the ERT's question regarding Chapter 1B, Slovenia provided useful information about all the data used. Therefore the ERT recommends adding this information to the IIR to improve the completeness of the report.

TRANSPORT

Review Scope

Pollutants Reviewed		SO ₂ , NO _x , NMVOC, NH ₃ , PM ₁₀ & PM _{2.5} , CO, HMs, POPs, activity data		
Years		1990 – 2009		
NFR Code	CRF_NFR Name	Reviewed	Not Reviewed	Recommendation Provided
1.A.3.a.i.(i)	international aviation (LTO)	x		
1.A.3.a.i.(ii)	international aviation (cruise)		x	
1.A.3.a.ii.(i)	civil aviation (domestic, LTO)	x		
1.A.3.a.ii.(ii)	civil aviation (domestic, cruise)		x	
1.A.3.b.i	road transport, passenger cars	x		
1.A.3.b.ii	road transport, light duty vehicles	x		
1.A.3.b.iii	road transport, heavy duty vehicles	x		
1.A.3.b.iv	road transport, mopeds & motorcycles	x		
1.A.3.b.v	road transport, gasoline evaporation	x		
1.A.3.b.vi	road transport, automobile tyre and brake wear	x		
1.A.3.b.vii	road transport, automobile road abrasion	x		
1.A.3.c	railways	x		
1.A.3.d.i (ii)	international inland navigation		NO	
1.A.3.d.ii	national navigation	x		
1.A.4.b.ii	household and gardening (mobile)	x		
1.A.4.c	agriculture / forestry / fishing	x		
1.A.4.c.ii	off-road vehicles and other machinery	x		
1.A.4.c.iii	national fishing	x		x
1.A.5.b	other, mobile (including military, land based and recreational boats)		NE	
1 A 3 d i (i)	International maritime navigation		x	
1 A 3	Transport (fuel used)		x	

Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which codes have been reviewed and which have not in the respective columns.

General recommendations on cross-cutting issues.

Transparency:

59. Slovenia has provided a detailed and transparent emissions inventory on transport. Estimates are provided at the most detailed level for all sub-sectors. The calculation method and emission factors are considered, by the ERT, to be transparent and well described in the IIR. The ERT encourages Slovenia to include some information on shipping and off-road vehicles/mobile machinery in the IIR.

Completeness:

60. The ERT considers the Transport sector to be complete and comprehensive with good levels of detail in the methodology descriptions for most pollutants, with the exception of other Heavy Metals. The ERT welcomes Slovenia's intention to estimate these pollutants from all sub-sectors in future submissions.

Consistency including recalculation and time series:

61. No consistency issues were identified for the transport sector. Trends in emissions are well described for the road transport sector. The ERT recommends that Slovenia includes similar descriptions of trends for the other transport sectors as well.

62. Slovenia has not recalculated emissions for any of the pollutants reported in the inventory. However, emissions for the entire time series 1990-2008 were recalculated last year when upgrading was undertaken from COPERT III to COPERT 4. The ERT recommends that Slovenia recalculates emissions for all years when using the latest version of COPERT 4 (v8.1) for the next submission.

Comparability:

63. The COPERT 4 v6.1 software has been used for calculating emissions from road transport. Although not fully consistent with the latest version of the Guidebook, it is not thought that this would introduce any significant errors in the submitted inventory. The ERT welcomes Slovenia's intention to use the latest version of COPERT 4, i.e. v8.1, for the next submission.

64. Based on reported activity data, there seem to be no significant over- or underestimations of emissions for any of the pollutants.

Accuracy and uncertainties:

65. Slovenia has provided some basic uncertainty estimates based on expert judgement. The ERT encourages Slovenia to undertake an uncertainty analysis in order to help inform the improvement process and to provide an indication of the reliability of the inventory data.

66. Slovenia has performed QA/QC activities, which are well described in the IIR. The ERT welcomes the development and implementation of a QA/QC plan and encourages Slovenia to implement additional QA/QC checks which are currently not performed.

Improvement:

67. The ERT welcomes Slovenia's intention to use the latest version of COPERT 4 (v8.1) and to include calculations of other heavy metals in the next submission.

Sub-sector Specific Recommendations.

Category issue 1: 1.A.3.d.ii National navigation: All Pollutants

68. During the review Slovenia stated that emissions from national navigation are included in the Agriculture/Forestry/Fishing (Off-road vehicles and other machinery) sector. The ERT recommends that Slovenia splits emissions from fishing boats into shipping and off-road vehicles/other machinery as described in the Guidebook.

INDUSTRIAL PROCESSES

Review Scope

Pollutants Reviewed		SO ₂ , NO _x , NMVOC, NH ₃ , PM ₁₀ , PM _{2.5} , Pb, Cd, Hg, PCB, Dioxins/Furans, PAH & HCB		
Years		1990 – 2009		
NFR Code	CRF_NFR Name	Reviewed	Not Reviewed	Recommendation Provided
2.A.1	cement production	x		x
2.A.2	lime production	x		x
2.A.3	limestone and dolomite use		x	
2.A.4	soda ash production and use		x	
2.A.5	asphalt roofing		x	
2.A.6	road paving with asphalt	x		x
2.A.7.a	Quarrying and mining of minerals other than coal		x	
2.A.7.b	Construction and demolition		x	
2.A.7.c	Storage, handling and transport of mineral products		x	
2.A.7.d	Other Mineral products (Please specify the sources included/excluded in the notes column to the right)	x		x
2.Bb.1	ammonia production	x	NO	x
2.B.2	nitric acid production		NO	
2.B.3	adipic acid production		NO	x
2.B.4	carbide production	x		x
2.B.5.a	Other chemical industry (Please specify the sources included/excluded in the notes column to the right)	x		x
2.B.5.b	Storage, handling and transport of chemical products (Please specify the sources included/excluded in the notes column to the right)		NO	
2.C.1	iron and steel production	x		x
2.C.2	ferroalloys production	x		x
2.C.3	aluminium production	x		x
2.C.5.a	Copper Production	x		x
2.C.5.b	Lead Production	x		x
2.C.5.c	Nickel Production		NO	
2.C.5.d	Zinc Production	x		x
2.C.5.e	Other metal production (Please specify the sources included/excluded in the notes column to the right)	x		x
2.C.5.f	Storage, handling and transport of metal products (Please specify the sources included/excluded in the notes column to the right)	x		x
2.D.1	pulp and paper	x		x
2.D.2	food and drink	x		x
2.D.3	Wood processing	x		x
2.E	production of POPs		x	
2.F	consumption of HM and POPs (e.g. electrical)		x	

	and scientific equipment)			
2.G	Other production, consumption, storage, transportation or handling of bulk products (Please specify the sources included/excluded in the notes column to the right)		x	x
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which codes have been reviewed and which have not in the respective columns.				

General recommendations on cross-cutting issues

Transparency:

69. Slovenia's inventory for the industrial processes sector is generally transparent and well organised. However, the ERT notes that a general overview, an overview per NFR sector (with a short description of all sources) and details on which tier methods have been used are missing. The ERT encourages Slovenia to add the missing elements to its next submission.

70. The emission factors used are default or country-/plant specific. For the calculation of key-source emissions only default emission factors have been used. The ERT has noted that it is not clear whether the country-/plant specific emission factors have been verified and encourages Slovenia to include information on such verification in its next submission.

71. Explanations of dips/jumps or other changes in the emission time series of the sub-sectors of the Industrial Processes sector are missing in both the emission trends chapter and the Industrial Processes sector chapter. In the Industrial Processes sector chapter, explanations of dips/jumps or other changes in the emission time series of the following key sources are missing:

- (a) 2A.1 Cement production (Cd)
- (b) 2C.1 Iron and Steel production (Pb, DIOX)
- (c) 2C.5a Copper production (Cd, Hg)
- (d) 2C.5b Lead production (Pb, Cd, Hg)
- (e) 2C.5d Zinc production (Pb, Hg, DIOX)
- (f) Additional details about 2C.5d are given in the sector section.

72. The ERT encourages the Party to include at least explanations of dips/jumps or other changes in the emission time series of the key sources in the Industrial Processes sector chapter.

Completeness:

73. The ERT considers the Industrial Processes sector to be almost complete for the main sources and comprehensive with good levels of detail in the methodology descriptions. Only the 2009 activity data and explanations for the use of the notation

keys NE and IE are not provided in both the IIR and the NFR tables. During the review Slovenia provided an overview with explanations for the used IEs and a general explanation for the use of the notation key NE.

74. The ERT strongly encourages Slovenia to include the complete activity data time series and the explanations for the use of the notation keys NE and IE in the next submissions. To avoid underestimations, the ERT recommends that Slovenia includes plans to address the missing emissions (NE) in its IIR, either by obtaining data to allow an emission estimate to be made, or by reporting the emissions as not applicable.

Consistency including recalculation and time series:

75. Compared to other sectors, the ERT notices that Slovenia has not performed recalculations for the Industrial Processes sector. There are no differences between the 2011 and 2010 submissions.

76. Both the time series of the activity data and EFs used to calculate emissions are consistent.

Comparability:

77. Slovenia has reported its emissions inventory in accordance with the reporting requirements and submitted it in the requested NFR format. However, the ERT noted that Slovenia not always used the available EFs from the EMEP/EEA emission inventory Guidebook 2009. To avoid under-/overestimations the ERT recommends that Slovenia uses the available EFs from the EMEP/EEA emission inventory Guidebook 2009 or country- or plant-specific EFs in the future.

78. Furthermore, the ERT has noted there are no differences between CLRTAP and NEC emissions in the IIR.

Accuracy and uncertainties:

79. In 2009, Slovenia developed and mostly implemented a Quality Assurance and Quality Control plan and at the beginning of 2009, a QA/QC manager was designated at the inventory agency. The ERT commends Slovenia for this and encourages the Party to complete the implementation of this plan and also to implement sector specific OA/QC procedures for the Industrial Processes Sector in the next submissions.

80. The ERT has noted that Slovenia intends to perform a sectoral peer review — one sector per year — of the inventory on a yearly basis. In May 2009, a peer review of the Slovenian inventory was performed for the energy sector. The ERT encourages Slovenia to continue with these sectoral peer reviews.

81. Checks of uncertainty were not performed in 2009 but are foreseen for 2010 according to the QA/QC plan. The ERT encourages Slovenia to perform also uncertainty checks for the Industrial Processes Sector in the next submissions.

Improvement:

82. The ERT has found that up to now only priority heavy metals (Pb, Cd and Hg) have been reported by Slovenia. Emissions for other heavy metals (As, Cr, Cu, Ni, Se, Zn) are planned to be included in future years.

83. Furthermore, the ERT encourages the Party — where possible — to use Tier 2 (or 3) methods for the key sources and to include more documentation of planned and expected improvements in the IIR.

Sub-sector Specific Recommendations.**Category issue 1: 2.A.7.d Manufacture of glass and glass products**

84. In the Executive Summary it is mentioned that Slovenia has developed a national emission factor for Pb from glass production (NFR code: 2A7) since 2003 (plant communication data 2003-2008). However, in the Mineral Industry (2A) part of the IIR nothing can be found of a national emission factor for Pb from glass production in 2A7d. The ERT encourages Slovenia to add this kind of information in the next IIR.

Category issue 2: 2.B.1 & 2.B.3 Ammonia and Adaptic Acid Production

85. The ERT has noted that in the NFR table the notation key NO has been used in the activity cell and NA in a number of pollutant cells with the same NFR code. The ERT recommends that Slovenia uses the notation key “NA” where the source exists but relevant emissions are considered as never occurring and “NO” where sources do not occur.

Category issue 3: 2.C.3 Aluminium production

86. In the Executive Summary it is mentioned that Slovenia developed a national emission factor for aluminium production. However, in the Metal Industry part nothing can be found about this national emission factor. The ERT encourages Slovenia to add this kind of information in the next IIR.

Category issue 4: 2.C.5.d Zinc Production

87. The ERT noted the production levels decreased during the period 1992-1996. After consultation, Slovenia answered that it had lost the largest part of its market in the region of former Yugoslavia after attaining independence in 1991. Therefore, industry production in Slovenia ceased and in some cases was even abandoned. Later on, when new markets were gained back, industry production started to increase. The ERT encourages Slovenia to include this kind of explanation in the next IIR.

SOLVENTS

Review Scope

Pollutants Reviewed		SO ₂ , NO _x , NMVOC, NH ₃ , PM ₁₀ & PM _{2.5} , Heavy Metals, CO, PAHs		
Years		1990 – 2009		
NFR Code	CRF_NFR Name	Reviewed	Not Reviewed	Recommendation Provided
3.A.1	Decorative coating application	x		x
3.A.2	Industrial coating application	x		x
3.A.3	Other coating application (Please specify the sources included/excluded in the notes column to the right)	x		x
3.B.1	Degreasing	x		x
3.B.2	Dry cleaning	x		x
3.C	Chemical products,	x		x
3.D.1	Printing	x		x
3.D.2	Domestic solvent use including fungicides	x		x
3.D.3	Other product use	x		x
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which codes have been reviewed and which have not in the respective columns.				

General recommendations on cross-cutting issues

Transparency:

88. The ERT notes that Slovenia has supplied limited information in the IIR about which SNAP activities were reported per source category, as well as the activity data and the methods / emission factors / assumptions used for the estimation of emissions from the solvents sector. During the review, Slovenia provided most of this information. The ERT commends Slovenia for that, but also encourages it to provide comprehensive activity data with a good level of detail as well as methodology descriptions in the next IIR.

89. The ERT has identified some improper use of the notation keys in the CLRTAP template. For example, the source category 3A1 has been reported as IE instead of NE. The ERT encourages Slovenia to fill in the worksheet entitled “Additional info” of the CLRTAP template for next year’s submission, where the use of NE and IE notation keys is explained.

90. The ERT notes that most reported emission estimates of the solvents sector are based on plant specific data, which are reported by the respective operators to the Environmental Agency of Slovenia pursuant to the “Decree on limit values for atmospheric emissions of volatile organic compounds from installations using organic solvents” (OJ. RS, No. 112/05, 37/07, 88/09 in 92/10). These plant specific data are based on measurements and mass balances of used solvents (solvent management plans). The Slovenian Inspectorate Body for the Environment enforces the implementation of this legislation, including the limit values and all procedures required. The ERT commends Slovenia for using plant specific data (high tier approach) for estimating emissions. However, the ERT encourages Slovenia to apply

QA verification procedures to check the reliability and the completeness of the reported emissions. An example of such a verification procedure is the comparison of the reported emissions with estimations obtained by using the respective per category activity data and Tier 1 EFs from the guidebook or EFs expressed per capita.

Completeness:

91. The ERT notes that NMVOC emissions from the source category 3A1 have not been estimated. NMVOC emissions from the 3C and 3D3 source categories are underestimated, since the emissions of a number of SNAP categories have not been included in the reported emissions. NO_x, PM₁₀ & PM_{2.5}, heavy metals, PAHs and CO from the 3C and 3D3 categories have also not been estimated. The ERT recommends that Slovenia improves the completeness of its reporting on the solvents sector by including these (not estimated) emissions in next year's submission.

92. The ERT notes that NMVOC emissions from the 3B, 3D1 and 3D3 source categories have not been reported for the years 1990-2004. The ERT encourages Slovenia to estimate the respective emissions. If the required data are not available, Slovenia could apply simple drivers such as population figures or the GDP to provide an estimation of the emissions for these years.

Consistency including recalculation and time series:

93. The ERT has identified some inconsistencies in the use of the notation keys for reporting NMVOC emissions for the 3B, 3D1 and 3D3 source categories for the years 1990 – 2004. During the review, Slovenia responded that emissions were not estimated for that period. The ERT recommends that Slovenia uses the correct notation key (i.e. NE) for that period.

Comparability:

94. The ERT has found that NMVOC emissions from 3C (plastic processing activities) may have been underestimated due to the use of an EF that is not in accordance with the latest Guidebook. The ERT encourages Slovenia to describe the rationale behind the selection of a different EF in the IIR where such a different EF (other than the ones described in the Guidebook) is used.

Accuracy and uncertainties:

95. The ERT notes that no uncertainty analysis has been performed by Slovenia for the solvents sector concerning CLRTAP emissions. The ERT encourages Slovenia to undertake an uncertainty analysis for the solvent sector in order to prioritize improvement actions and to provide an indication of the reliability of the inventory data.

96. Slovenia performs general QA/QC procedures according to the ISEE electronic common database used for GHG and CLRTAP reporting. The ERT has found that Slovenia neither carries out specific QC procedures for the solvents sector, nor any other QA verification procedure. The ERT encourages Slovenia to implement sector specific QA/QC procedures for NMVOC emissions of the solvents sector, such as the verification procedures described in the Transparency section.

Improvement:

97. The ERT notes that no improvement plan for the solvents sector has been reported in the IIR. However, during the review, Slovenia responded that it planned some improvements related to the harmonisation of reported emissions with the 2009 Guidebook, especially in the source categories 3C and 3D. The ERT commends Slovenia for these plans and encourages Slovenia to include the respective outcomes in the next submission.

Sub-sector Specific Recommendations.**Category issue 1: 3.A Paints and Coatings – NMVOC**

98. The ERT has found that the 3A1 source category has not been estimated, since the SNAP activities 060103 and 060104 are not included in the reported emissions. The ERT encourages Slovenia to estimate these emissions and report them in the next submission. Where activity data are not available, Slovenia may use EFs per capita, as described in the Guidebook.

99. During the review, Slovenia responded that the SNAP activity 060405 “Application of glues and adhesives” is included in the 3A3 source category. The ERT encourages Slovenia to reallocate these emissions to the 3D3 source category.

100. During the review, Slovenia responded that emissions from the 3A source categories had not been calculated from AD and EFs, but obtained from the sum of plant specific data reported by the respective operators to the Environmental Agency of Slovenia pursuant to the “Decree on limit values for atmospheric emissions of volatile organic compounds from installations using organic solvents”. However, the ERT notes that the ratio of per capita NMVOC emissions of the 3A source category is the lowest ratio compared to its neighbouring countries. Therefore, the ERT encourages Slovenia to verify its reported NMVOC emissions by using, on the one hand, paints and coatings sales statistics as a source of the activity data, and on the other hand the respective EFs from the 2009 Guidebook.

101. The ERT notes that the reported NMVOC emission figures were identical for the entire period 1996-2006. During the review, Slovenia responded that since the Statistical Office of the Republic of Slovenia stopped reporting the consumption of paints, varnishes and similar coatings in 1996, the emissions of 1996 had been reported for each year of the time series up to 2004. The ERT encourages Slovenia to apply simple drivers such as population figures or the GDP to provide an estimation of these years' emissions.

Category issue 2: 3.B Dry Cleaning and Degreasing – NMVOC

102. The ERT has identified some inconsistencies in the use of the notation keys for the 3B source category for the years 1990 – 2004. During the review, Slovenia responded that the emissions had not been estimated for that period. The ERT recommends that Slovenia uses the correct notation key i.e. NE for that period. However, the ERT encourages Slovenia to estimate the respective emissions. If the required data are not available, Slovenia could apply simple drivers such as population figures or the GDP to provide an estimation of the emissions for these years.

103. During the review, Slovenia responded that emissions from the 3B source categories had not been calculated from AD and EFs, but were obtained from the sum of plant specific data reported by the respective operators to the Environmental Agency of Slovenia pursuant to the “Decree on limit values for atmospheric emissions of volatile organic compounds from installations using organic solvents”. However, the ERT notes that the ratio of per capita NMVOC emissions of the 3B source category is significantly lower compared to Slovenia’s neighbouring countries. Therefore, the ERT encourages Slovenia to verify the reported NMVOC emissions by using, on the one hand, activity data from national statistics, and on the other hand the respective EFs from the 2009 Guidebook.

Category issue 3: 3.C Chemical Products, Manufacture & Processing – NMVOC, TSP, heavy metals and PAHs

104. The ERT has found that the NMVOC emissions from the 3C plastic processing activities may have been underestimated due to the use of an EF that is lower than the proposed ones in the 2009 Guidebook. During the review, Slovenia responded that the EF selection was based on expert judgement, because the AD provided by the Statistical Office were not detailed enough and it was difficult to categorize AD per plastic type, or to distinguish between a process of plastic synthesis of or a mere reforming of plastic material. The ERT encourages Slovenia to describe the rationale behind the selection of a different EF in the IIR where such a different EF (other than the ones described in the uideobook) is used. Moreover, the ERT encourages Slovenia to recalculate these emissions according to the EFs included in the 2009 Guidebook and to report them in the next submission.

105. The ERT has noted from Slovenia’s replies during the review that the SNAP categories 060308, 060310, 060311 and 060312 were not estimated. The ERT encourages Slovenia to estimate NMVOC emissions for the above mentioned activities that take place within its territory and to report them in the next submission. Especially for the SNAP category 060310 “Asphalt blowing”, Slovenia is encouraged to estimate and report - in the next submission - TSP, heavy metals and PAHs emissions, by applying the simple Tier 2 methods from the 2009 Guidebook.

Category issue 4: 3.D.1, 3.D.2 and 3.D.3 – NMVOC, NO_x, CO, PM₁₀ & PM_{2.5}, heavy metals and PAHs

106. The ERT notes that although the 3D2 is a key source of NMVOC, no information is provided in the IIR about this category. During the review, Slovenia responded that the Default Emission Factor Handbook, second edition, 1992, had been used (EF – 2,5 kg/capita/year). The ERT encourages Slovenia to include this information in the next submission. Moreover, the ERT encourages Slovenia to recalculate these emissions by applying EFs from the 2009 Guidebook.

107. The ERT has identified some inconsistencies in the reporting of NMVOC emissions for the 3D1 and 3D3 source categories for the years 1990 – 2004. During the review, Slovenia responded that these emissions had not been estimated for that period. The ERT recommends that Slovenia uses the correct notation key (i.e. NE) for that period. However, the ERT encourages Slovenia to estimate the respective emissions. If the required data are limited, Slovenia could apply simple drivers such

as population figures or the GDP to provide an estimation for the emissions of these years.

108. The ERT noted from Slovenia's replies during the review that a number of SNAP categories of the 3D3 source category had not been estimated. The ERT encourages Slovenia to estimate the NMVOC emissions for the above mentioned activities that take place within its territory and to report them in the next submission. Slovenia is also encouraged to estimate and report, in the next submission, NO_x, CO, PM₁₀ & PM_{2.5}, heavy metals and PAHs emissions from SNAP activity 060602, by applying the simple Tier 2 method from the 2009 Guidebook.

109. The ERT noted from Slovenia's replies during the review that the PAH emissions from wood preservation when creosote preservatives are used had been reported under 3A3. The ERT encourages Slovenia to reallocate these emissions to the 3D3 source category.

AGRICULTURE

Review Scope:

Pollutants Reviewed		NO _x , NMVOC, NH ₃ , PM ₁₀ & PM _{2.5}		
Years		All the years submitted by the country		
NFR Code	CRF_NFR Name	Reviewed	Not Reviewed	Recommendation Provided
4 B 1 a	Cattle dairy	x		
4 B 1 b	Cattle non-dairy	x		x
4 B 2	Buffalo		x	x
4 B 3	Sheep	x		x
4 B 4	Goats	x		x
4 B 6	Horses	x		x
4 B 7	Mules and asses		x	x
4 B 8	Swine	x		
4 B 9 a	Laying hens	x		x
4 B 9 b	Broilers	x		x
4 B 9 c	Turkeys	x		x
4 B 9 d	Other poultry	x		x
4 B 13	4 B 13 Other		x	x
4 D 1 a	Synthetic N fertilizers	x		x
4 D 2 a	Farm-level agricultural operations including storage, handling and transport of agricultural products		x	
4 D 2 a	Off-farm storage, handling and transport of bulk agricultural products		x	
4 D 2 c	N excretion on pasture range and paddock unspecified (Please specify the sources included/excluded in the notes column to the right)		x	
4 F	Field burning of agricultural wastes		x	
4 G	Agriculture other(c)		x	
11 A	(11 08 Volcanoes)		x	
11 B	Forest fires		x	

Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which codes have been reviewed and which have not in the respective columns.

General recommendations on cross-cutting issues

Transparency:

110. The ERT would like to thank the Party for providing comprehensive (including well documented attached files) and quick responses during the review process.

111. The activity data used as basis for emission calculations are generally not provided in the IIR. Thus the ERT was unable to analyse the emission results with regard to activity data. The ERT recommends that Slovenia provides activity data, especially because these data have already been reported in the UNFCCC report (NIR).

112. The methodology used to calculate PM emissions is not provided in the report. The ERT recommends that Slovenia provides a detailed description of the methodology in the IIR, with tables providing activity data and an explanation of

emission factors coming from the CEPMEIP EF database and from the Austrian inventories.

113. Slovenia does not provide the level of the method used in the current IIR. However, Slovenia was able to provide it during the review process and should therefore provide it in the IIR.

Completeness:

114. The agriculture inventory of Slovenia covers the most important sources of emissions with the exception of estimates for emissions of NO_x for all the NFR codes in the agriculture sector. The EMEP/EAA Guidebook offers methodologies for NO_x emissions from the excreta of livestock and from agricultural soils (related to nitrogen fertilizers applied). The Slovenian inventory does not cover NMVOC emissions. The ERT thanks the country for its willingness to assess the emissions from these sources for future submissions, using default factors from EMEP/EAA Guidebooks. The ERT also encourages the Party to use the appropriate notation keys (e.g. NO (Not Occurring)) where the source does not exist, NA (Not Applicable) where the source exists but where there are no emissions, NE where emissions are “Not Estimated” and IE where emissions are “Included Elsewhere”) for reporting where estimates are not available or necessary. In the case of Slovenia, and for the last report, NE should be used for NO_x and NMVOC from the agriculture sector because these emissions exist but Slovenia does not report them.

Consistency including recalculation and time series:

115. No consistency issues were identified by the ERT for the Agriculture sector.

Comparability:

116. Slovenia mainly uses the EMEP/EEA Guidebook 2002 to estimate NH₃ emissions. Therefore, Slovenia estimates emissions from legume crops (included in 4D1) even if it is no longer recommended by the EMEP/EEA Guidebook 2009. The ERT recommends that Slovenia uses a more recent guidebook (EMEP 2007 or 2009).

117. For NH₃ emissions, national totals reported under LRTAP are different from those reported under NECD. The ERT recommends that the Party harmonises these two values or explains these discrepancies in the next submission.

Accuracy and uncertainties:

118. The ERT encourages the Party to undertake an uncertainty analysis for the agriculture sector (qualitative at least) in order to help inform the improvement process and to provide an indication of the reliability of the inventory data.

Improvement:

119. Even if no methodological improvements are planned, the ERT strongly encourages the Slovenia to improve the transparency of reporting by providing a complete agriculture chapter in the IIR (especially activity data and EFs for all reported pollutants). The ERT also recommends that the Party provides a qualitative uncertainty analysis.

Sub-sector Specific Recommendations.

Category issue 1: 4.B Manure management: NH₃

120. Slovenia considers that 50% of loose housing system manure stores are covered but does not provide a reference for this figure in the IIR. During the stage 3 review, Slovenia provided a good explanation and the ERT thanks the country for its willingness to provide relevant answers. Therefore, the ERT encourages the country to insert more explanations in the IIR about the penetration rates of abatement measures.

121. The impact of milk yields on excretion rates is not very clear in the IIR and the ERT suggests that Slovenia explains this more carefully by providing milk yield changes from 1990 onwards. Slovenia is encouraged by the ERT to provide more detailed information in its next IIR on the data used for calculations and on the inclusion of activity data for 4B Manure Management.

Category issue 2: 4.D.1 Agricultural Soils: NH₃

122. The ERT encourages Slovenia to provide detailed information on the breakdown of national fertilizer consumption into the relevant compounds in use, which are accounted for in emission estimates under 4D1 Direct Soil Emissions.

WASTE

Review Scope:

Pollutants Reviewed		All pollutants		
Years		1990-2009		
NFR Code	CRF_NFR Name	Reviewed	Not Reviewed	Recommendation Provided
6.A	solid waste disposal on land	x		x
6.B	waste-water handling			x
6 C a	6 C a Clinical waste incineration (d)	x		x
6 C b	Industrial waste incineration (d)	x		x
6 C c	Municipal waste incineration (d)			
6 C d	Cremation			x
6 C e	Small-scale waste burning			
6.D	other waste (e)			x
Note: Where a sector has been partially reviewed (e.g. some of the NFR codes) please indicate which codes have been reviewed and which have not in the respective columns.				

General recommendations on cross-cutting issues

Transparency:

123. In its IIR 2011 waste sector description, Slovenia describes calculation methodologies for clinical and industrial waste incineration. No information is provided about PM_{2.5}, PM₁₀ and TSP calculation methods from solid waste disposal. The ERT encourages Slovenia to provide activity data and emission factors for all calculated sources and all pollutants in the IIR.

Completeness:

124. Slovenia reports emissions from clinical and industrial waste incineration and also from solid waste disposal. Not all pollutants are included in calculations. The ERT encourages Slovenia to review NFR 6 and to include missing sources and missing pollutants in its inventory. If there are no possibilities for calculating emissions due to a lack of activity data or EF, explanations should be provided in the IIR. For sectors where emissions are calculated, the ERT encourages Slovenia to provide activity data in the NFR tables.

Consistency, including recalculation and time series:

125. Data about solid particle emissions are consistent for the years 2000-2005. From 2006 onwards, the time series values have increased. ERT encourages Slovenia to explain these changes in its IIR. No data has been reported for 1990 - 1999. The ERT recommends assessing the possibilities and calculating emissions from 1990 to 2000.

Comparability:

126. Clinical and industrial waste incineration emissions are comparable. For PM_{2.5}, PM₁₀ and TSP waste disposal emissions, comparability is hard to estimate since Slovenia uses a country specific methodology.

Accuracy and uncertainties:

127. The QA/QC procedures for the waste sector are not described in the IIR 2011. The ERT encourages developing and implementing QA/QC procedures for the inventory preparation process. Slovenia does not provide an uncertainty analysis in the IIR. The ERT recommends estimating uncertainties for activity data and emission factors that are used in the emission calculations.

Improvement:

128. No improvements are mentioned in Slovenia's IIR 2011. Emission calculations from other waste sub-sectors could be added to the inventory.

Sub-sector Specific Recommendations.

Category issue 1: 6.A - Solid waste disposal on land

129. The ERT recommends that Slovenia estimates NMVOCs emitted from solid waste disposal. For calculations the EMEP/EEA Emission Inventory Guidebook 2009 could be used. The NMVOC default EF is available in chapter 6.A Solid waste disposal on land Table 3-1. CH₄ emission estimates are available from the UNFCCC.

Category issue 2: 6.B - Waste-water handling

130. Slovenia does not estimate emissions from waste-water handling. The ERT encourages Slovenia to estimate NH₃ and NMVOC emissions according to the EMEP/EEA Emission Inventory Guidebook 2009. For Slovenia data is available about inhabitants connected to various types of domestic waste-water treatment. Slovenia can use these data to estimate NH₃ emissions, the methodology is provided in the EMEP/EEA Emission Inventory Guidebook 2009. To estimate NMVOC emissions, data on waste-water values could be used. Where it is not possible to make reliable estimates, the ERT encourages Slovenia to explain the reasons for such exclusions in the IIR.

Category issue 3: 6.C.a – Clinical waste incineration

131. The ERT encourages Slovenia to calculate all pollutants from clinical waste incineration for which EFs are available in the EMEP/EEA Emission Inventory Guidebook 2009. The ERT recommends that Slovenia reviews the sharp emission increase for the year 2009. If it is not a mistake, this emission increase should be explained in the IIR.

Category issue 4: 6.C.b - Industrial waste incineration

132. The ERT encourages Slovenia to calculate all pollutants from industrial waste incineration; factors from the EMEP/EEA Emission Inventory Guidebook 2009 could be used. The trend shows sharp increases of emissions for the year 2008. The ERT encourages Slovenia to review the calculations for this year and to make corrections if necessary.

Category issue 5: 6.C.d - Cremation

133. Slovenia does not calculate emissions from cremation. If it is not possible to get activity data, the ERT recommends providing explanations in the IIR.

Category issue 6: 6.D - Other waste

134. Slovenia uses NE for this subsector. The ERT recommends describing what kind of activities take place in Slovenia; if there are no activities, NE should be changed to NO. If any activities can be identified according to the EMEP/EEA Emission Inventory Guidebook 2009, the ERT recommends calculating these emissions according to the Guidebook.

LIST OF ADDITIONAL MATERIALS PROVIDED BY THE COUNTRY DURING THE REVIEW

1. Energy: additional materials provided by Slovenia during the Stage 3 Review week; ERT_Energy_Question1.xls, ERT_Energy_Question3.xls.
2. Agriculture: additional materials provided by Slovenia during the Stage 3 Review week; ERT_Agriculture_Question3.xls, ERT_Agriculture_Question4.xls, ERT_Agriculture_Question7.xls.